

Appl. No. 10/523,619; Docket No. NL02 0709 US
Amdt. dated June 1, 2006
Response to Office Action of April 6, 2006

Amendments to the Specification

On page 1, paragraphs 2 and 3 please amend, as shown.

When designing a receiver or transmitter for dual frequency operation a common choice of antenna arrangement comprises a first mono pole antenna tuned for a first operating frequency and a second monopole antenna tuned for a second operating frequency and selecting the antenna to be used depending on the ~~chosen~~ chosen frequency of operation. When another frequency of operation is ~~chosen~~ chosen the associated antenna is selected and transmission and reception accomplished through this antenna.

The monopole antenna is often ~~chosen~~ chosen because of it's low cost.

On page 2, paragraphs 4 and 5, please amend as shown.

A further embodiment of the invention is characterized in that the first antenna element is a mono-pole antenna. The mono-pole is a very simple form of antenna that can function as the radiating element in an antenna and as a reflector or director and is thus especially suitable for use in the ~~arrangement~~ arrangement gment according to the present invention.

A further embodiment is characterized in that the second antenna element is a mono-pole antenna. The mono-pole is a very simple form of antenna that can function as the radiating element in an antenna and as a reflector or director and is thus especially suitable for use in the antenna ~~arrangement~~ arrangement according to the present invention.

On page 3, paragraph 3, please amend as shown

A further embodiment of the transceiver is characterized in that the transceiver is arranged to use the first antenna arrangement and the second antenna arrangement for beam steering. Since two directional antenna arrangements can be used with the

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transceiver, because of the antenna arrangements compact size and directional characteristics, it is possible to employ ~~beamsteering~~ beam-steering in order to improve the transmission and reception. Any method for ~~beamsteering~~ beam-steering using two directional antenna arrangements can be used to obtain the ~~beamsteering~~ beam-steering.

On page 3, paragraph 5, please amend as shown.

By placing the antenna arrangements and the antenna elements in this position the theta components, ~~[[ie.e]]~~ i.e., horizontal polarization of the antenna, are directed in the horizontal plane.

On page 4, paragraph 10, please amend as shown.

In the figures 1-3 the first antenna is drawn as a short monopole antenna while the second antenna is drawn as a longer monopole antenna. Even though the figures are intended as schematic diagrams that normally not confer information about physical proportions, the antennas are drawn similar to a normal configuration, i.e. one antenna ~~shorter than~~ shorter than the other antenna and placed at a distance of each other which is comparable to the length of the short antenna. In figure 8 a physical arrangement of the antenna arrangement is shown.

On page 6, paragraph 2, please amend as shown.

Figure 2 shows a communication device comprising two antenna arrangements comprising two mono-pole antennas each. The communication device 20 comprises a transceiver 21 which uses antenna diversity to obtain the best reception quality. The switches 23, 24 allow the transceiver to select two of a total of four antennas 25, 26, 27, 28. The first antenna 26 and the fourth antenna 28 have the same first operational frequency while the second antenna 25 and the third antenna 27 have the same second operational frequency. The first antenna 26 and second antenna 25 are physically grouped together, and the third ~~antenna 27~~ antenna 27 and the fourth antenna 28 are

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physically grouped together. The first antenna 26 operates at a higher frequency as the second antenna 25 and forms, because of its shorter length than, and proximity to, the second antenna, a director for the second antenna 25. The second antenna 25 operates at a lower frequency than the first antenna 26 and forms, because of its longer length, and proximity to, the first antenna 26, a reflector for the first antenna 26. The same is true for the combination of the third antenna 27 and the fourth antenna 28 where the fourth antenna 28 acts as a director for the third antenna 27 and the third antenna 27 acts as a reflector for the fourth antenna 28.

On page 7, paragraph 2 and 3, please amend as shown.

As explained in figure 1b the first antenna 34 acts as a director for the second antenna 35 and the ~~second~~ second antenna 35 acts as a reflector for the first antenna 34. The fourth antenna 33 acts as a director for the third antenna 36 and the third antenna 36 acts as a reflector for the fourth antenna 33. If the antennas are physically located as shown in figure 3 the main lobe of the radiation pattern of the first antenna 34 and the second antenna 35 is directed to the left and the main lobe of the radiation pattern of the third ~~antenna~~ antenna 36 and the fourth antenna 33 is directed to the right. This provides the differences in signal reception as desirable for antenna diversity.

As explained in the description of figure 1b the first transceiver 31 is matched to the antennas 35, 36 it is connected to at the operational frequencies of the antennas 35, 36, but must provide an appropriate termination impedance at the operational frequency of the second transceiver 32 ~~in-er~~ in order to turn the connected antennas 35, 36 into reflectors for the antennas 33, 34 connected to the second transceiver 32.

On page 7, paragraph 6, please amend as shown.

Figure 4 shows the radiation pattern of the antenna operating at the first frequency in the antenna arrangement when the second antenna element acts as a reflector. As can be seen the reflector causes the ~~omnidirectional radiation~~ omnidirectional radiation pattern of a regular monopole to be changed into a direction pattern with a main lobe 40.

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On page 8, paragraph 1, please amend as shown

As can be seen the director causes the ~~omnidirectional radiation~~ omnidirectional radiation pattern of a regular monopole to be changed into a direction pattern with a main lobe 50.

In the Abstract, please amend as shown.

Consistent with an example embodiment, using Using two simple antennas with different frequencies of operation combined into an antenna arrangement a directional radiation pattern is obtained for both frequencies of operation. This is achieved by placing the antennas such that the first antenna acts as a director for the second antenna at the frequency of operation of the second antenna and the second antenna acts as a reflector for the first antenna at the frequency of operation of the first antenna. In another example embodiment, in ~~In~~ the case of a monopole antenna the ~~the~~ first antenna is shorter than the second antenna and can thus operate as a director while the second antenna is longer than the first antenna and can thus act as a reflector.

Fig 3-